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## ***The Entrepreneurial State* by Mariana Mazzucato: A critical engagement**

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### **Introduction: embedding the ‘entrepreneurial state’**

If one had to name an innovation policy book that made it into mainstream political debates, Mariana Mazzucato’s 2013 *The Entrepreneurial State* would surely come to mind. The book expands on a 2011 pamphlet with the same title (Mazzucato, 2011) that had an impact among top officials both in the European Union and the United Kingdom. The book’s success – it has been praised by figures such as Martin Wolf, David Willets and Liam Byrne, and was awarded the 2014 *New Statesman* SPERI Prize in Political Economy – undoubtedly contributed to Mazzucato’s appointment to Jeremy Corbyn’s economic advisory board. *The Entrepreneurial State* seeks to answer the right questions at the right moment. If years of fiscal consolidation and austerity have miserably failed to promote growth and prosperity, Mazzucato aims to criticise the very roots of these policies. She demolishes the idea that diminished state intervention will reduce fiscal deficits and enhance innovation in the private sector. Behind many of the innovations commonly attributed to market dynamism – she shows – one actually finds state interventionism. The main goal of her book, then, is ‘to change how we talk about the state’ as ‘the most effective way to defend its existence, and size, in a proactive way’ (Loc. 419).

### **The state as risk-taking and market-shaping**

Although the book has been widely read and discussed, it is worth presenting its structure and argument. In Chapter 2 Mazzucato criticises the ‘market failure’ approach according to which innovation takes place in the private sector while the state just supports basic research, levying taxes on polluting firms and funding infrastructural projects. New growth theory offers an alternative view of technological change as the endogenous outcome of R&D and investment in

human capital. Mazzucato, however, criticises the linear logic underlying this theory and follows Schumpeterian economists in emphasising the importance of economic systems in stimulating innovation. Combining Schumpeter and Keynes, then, she argues for the centrality of government intervention in innovation systems. If the developmental state literature understood the state's role in 'developing' countries, both in terms of Keynesian demand management *and* in leading the industrial process, so should western states acknowledge their centrality in the innovation process and in the struggle for global competition. The 2011 pamphlet makes this distinction more clearly:

Just as developing nations can successfully plan to catch up with western nations, so any state can spur the development of technological solutions and/or the furtherance of practical knowledge in a given sector simply by catalysing a networked economy to engage in multiple innovations. Unlike in a developing economy, where the technology is already available elsewhere in the world, an entrepreneurial state does not yet know what the details of the innovation are, but it knows a general area that is ripe for development, or where pushing the boundaries of knowledge are desirable. (Mazzucato, 2011: 70–71).

The book's focus on the West explains its title: the *entrepreneurial*, not the *developmental* state.

In Chapters 3 and 4 Mazzucato puts forwards her own view of the entrepreneurial state. Puncturing myths of venture capital as risk-loving, she shows that the United States (US) government has funded the riskiest basic and applied research, often generating the most path-breaking types of innovation. Venture capital, on the contrary, would mainly invest 'in areas of high potential growth, low technological complexity and low capital intensity' (Loc. 1277). US government programmes such as the Small Business Innovation Research (SBIR)<sup>1</sup> and the Advanced Technology Program (ATP) in the US Commerce Department, for example, 'have provided 20–25 per cent of total funding for early stage technology firms'. (Loc. 1263). During the Cold War, it was the US Defense Advanced Research Projects Agency (DARPA) that played a crucial role in the development of the computer industry. The same holds true in the pharmaceutical and biotech industries: government support has been essential to the most radical innovations, while private companies mainly focus on development and marketing. The US government is also the largest investor in the National Nanotechnology Initiative, which – Mazzucato highlights – has the potential significantly to strengthen US economic and military power.

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<sup>1</sup> This programme was launched by the Reagan administration in 1982.

Reflecting on Europe in the light of the US example, Mazzucato argues that R&D is not enough for firms to succeed and questions the assumptions of the European Union's innovation-led growth policies (2000 Lisbon Agenda; Europe 2020 strategy). The problems of the EU – including of its peripheral member states – would mainly depend on its weaker system of scientific research in comparison to the US. European states should therefore directly commission research and increase their funds for it. In the Appendix, Mazzucato reproduces a list of policy suggestions to the UK government that she had initially published in the 2011 pamphlet. In her view, instead of reducing state intervention and expecting the private sector to spontaneously promote innovation and competitiveness, the UK government should; increase its commitment to its own Small Business Research Initiative (SBRI); cut blanket support to small firms; shift from providing tax credits for R&D to commissioning R&D by expanding the Technology Strategy Board (now *Innovate UK*); stop promoting low tax enterprise zones; and scrap the patent box. As the executive director of policy and research at Nesta (the UK foundation for innovation), Stian Westlake, highlights (2014), these proposals have been advocated by a wide range of economists and innovation experts.

The 2013 book presents more concrete examples of innovation processes than the 2011 pamphlet. Chapter 5 looks closely at the crucial role that the US state played in Apple's success, while the following two chapters broaden the gaze to the so-called green industrial revolution. Apple – Mazzucato argues – was able to 'ride the wave' of massive state investments in the Internet, GPS, touch-screen displays and communication technologies. It succeeded in *integrating* (rather than *developing*) new technologies and components developed by the US government and military, or through public-private partnership. But Apple actually ranks in the bottom three in terms of the portion of sales allocated to supporting R&D activities among thirteen of its top rivals (Schmidt, 2012). The US government has also played a major role in protecting Apple's intellectual property rights, in guaranteeing its access to foreign markets, and in providing tax and procurement support. The examples of the wind and solar tech industries in Chapter 6 and 7 also prove the centrality of the state's 'visible hand'. States like Germany, China and Brazil have used post-crisis stimulus spending to invest in global clean industries through their state investment banks (the KfW in Germany) and their development banks (China and Brazil). The UK, on the contrary, has cut funds for green initiatives, while the US has had an ambiguous approach, providing funding, but with uneven results. Mazzucato admits that 'the US has historically funded fossil and nuclear energy to a much greater degree' than green initiatives (Loc. 2719), but does not

expand on this. Rather, she argues that the US's and UK's disappointing records depend on their excessive reliance on venture capital. By leaving it to the market to decide – she warns – both countries risk missing opportunities to seize on the energy transition.

### **Socialisation of risks, privatisation of rewards**

The first part of *The Entrepreneurial State* is mainly aimed at reversing prejudices about the contributions of the private and public sectors in the innovation process. One could then ask who gets the return from risk-taking in innovation. The last part of the book is devoted to this issue, and it is here that the book's shortcomings become more evident. It is commonly assumed, Mazzucato argues, that the state receives indirect returns from innovation via higher tax receipts resulting from economic growth. While this mechanism functioned in what she calls, following Lazonick (2009), the Old Economic Business Model (OEBM) – broadly coinciding with the so-called Fordist accumulation model (1945–80) –, in the New Economic Business Model (NEBM) the tax system cannot be relied on because of the globalisation of production and tax avoidance and evasion. The case of Apple, discussed in Chapter 8, is a good example of this. It is here that Mazzucato first mentions the globalisation of production. In addition to providing funding and essential technological innovations, she argues, the US government also supports Apple in its search for lower production costs abroad (Loc. 3501). Since Apple's production activities have massively shifted to low wage countries, the only benefit for the US in terms of employment creation has been in low-paid retail jobs (Vascellaro, 2012). If the value of Apple products appears to be *generated* mainly in low wage countries, Mazzucato's main preoccupation is how much of the value *captured* in the US is converted into taxes.<sup>2</sup> The answer is 'not much', as Apple minimises its tax liabilities, both in the US and globally, by exploiting tax heavens and gaming cross-border tax rules.

To be clear, Mazzucato does not question the right of the late Steve Jobs or others to accumulate profits. In her view, Jobs's 'steadfast focus on architectural innovations that disrupt the markets in which they compete are the reason that he managed and deserved to capture a significant share of the rewards – and recognition – that followed.' (Loc. 3568). She also argues that the success of

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<sup>2</sup> 'Kraemer and colleagues (2011) estimate that, of the total value that is created per device, Apple recoups 58.5 per cent in profit. By further deducing the share of other non-Apple US profits (approximately 2.4 per cent) from the total value, then 30 per cent of the value is captured in non-US markets' (Loc. 3521).

the company depends on its 'talented workforce', a workforce that – she elsewhere admits – is not mainly located in the US since Apple 'scatters its own R&D and manufacturing activities around the globe leaving little to the US but low-paid retail positions.' (Loc. 3816). Mazzucato, however, is not interested in delving into controversies about value creation and – with a twisted argument – ends up assuming that value is created where corporations must pay their corporate tax. She follows Sullivan (2012: 777) in arguing:

There will never be a precise answer as to where profits are created. But if the corporate tax is a tax on income, it is reasonable to place products where value is created. In Apple's case, can there be any doubt that most of its value is created inside the US?

This is a particularly problematic argument since the US taxes corporate profits wherever they are generated. It confirms John Smith's (2012) criticism of the 'GDP illusion', that is, conventional national-income accounting according to which Apple's profit margins are counted as supposed value added generated within the United State. This argument sounds particularly implausible also in the light of the European Commission's charging Apple 13 billion Euros (plus interest) for allegedly avoiding taxes on profits generated throughout the EU but recorded in Ireland<sup>3</sup>. It is in the light of this argument, however, that Mazzucato identifies the 'paradox' as to why successful innovation has failed to promote growth and prosperity for the United States, thus disrupting the virtuous cycle of innovation and national growth presupposed by mainstream economic theory. After all, if innovation determines the growth of output per head in the national economy, and the growth of output per head determines living standards, living standards should have improved in the United States.

In theory, the effects of successful innovation, which leads to a superior outcome, should be seen and experienced within the wider economy. As superior outcomes lead to new products and/or services that, in turn, improve the quality of lives, create new employment opportunities for the able workforce, significantly increase the nation's foreign export and competitiveness, and then lead to significant increases in tax revenues, it is often believed that investments in innovation would eventually be reinvested in the

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<sup>3</sup> The amount charged to Apple would pay for Ireland's entire health-care budget in 2016 (*Financial Times*, 3 September 2016).

nation's tangible and intangible assets. Through this upward cycle of multiplying State investments in the science and technology base, the national economy would pave the way for future sustainable prosperity. (Loc. 3598).

And yet,

Decades of government investment in the science and technology base have made the US a successful innovator, but have paradoxically failed to secure high levels of employment, to increase tax revenues, and to promote the export of goods and services (Loc. 3604).

The case of Apple shows that in spite of the state's role in innovation, big companies appropriate the returns. The idea behind *The Entrepreneurial State* is that understanding the actual role of the state in promoting innovation would make it possible to redistribute gains and make growth fairer (Loc. 3717). For Mazzucato, it is not enough to criticise exorbitant bank bonuses and shareholder profits on moral grounds, because they produce inequality. An effective critique of inequality requires questioning the logic that justifies it; it requires delving into the relationship between the dynamics of innovation and that of inequality. These areas of economic thought – Mazzucato argues – have been separated since Ricardo's and Marx's studies of the effects of mechanisation on the distribution of wages and profits. Yet Mazzucato does not engage with either of them; she just criticises recent research on the effects of innovation on low- and high-skilled wages for failing to explain why **the different** agents that take part in the innovation process within a sector reap very unequal benefits from it. She goes on to argue that since skyrocketing shareholder profits are not the results of the high risks shareholders take; since innovation is a *collective* process involving workers, taxpayers and governments – it *logically* follows that the rewards should be collectively distributed. The neoliberal credo attributing innovation to the private sector, on the contrary, demands that workers, taxpayers and governments let companies become super rich at their expense.

### **What is to be done?**

According to the risk-reward nexus framework elaborated by Lazonick and Mazzucato (2013), if the distribution of rewards reflected the actors' contribution to innovation, growth would reduce inequality and the instability and uncertainty resulting from it, thus avoiding slowdowns or even

decline in economic growth.

As a general set of propositions of the risk-rewards nexus, when the appropriation of rewards outstrips the bearing of risk in the innovation process, the result is inequity; when the extent of inequity disrupts investment in the innovation process, the result is instability; and when the extent of instability increases the uncertainty of the innovation process, the result is a slowdown or even decline in economic growth. A major challenge is to put in place institutions to regulate the risk-reward nexus so that it supports equitable and stable economic growth. (Loc. 3752).

Although Mazzucato does not systematically discuss the relationship between the dynamics of innovation and that of inequality, she alludes to the possibility of a post-recovery growth that benefits everyone in western economies.

She advances some proposals of how the state can earn back not just an indirect, but also a direct return from its risky investments. In her view, the tax system (which involves the state indirectly benefitting from innovation through tax returns generated by growth) is ill equipped to support long-term innovation and to addressing the problems of tax avoidance and tax evasion in a context of capital mobility.<sup>4</sup> Mazzucato therefore suggests changing the balance of risks and rewards the state faces when it comes to innovation. She suggests three ways of doing this. First, the state should receive royalties from the application of state-funded technological breakthroughs, and returns from these royalties should be paid into a 'national innovation fund'. Secondly, the state should put conditions on state loans and grants (for example paying back a share of the profits exceeding a certain threshold) and retain equity in the companies that it supports. The third solution is establishing development banks like China Development Bank (CDB) and the Brazilian Development Bank (BNDES). Mazzucato anticipates that these proposals could be criticised as leading to 'communism' but, she stresses, this is not communism at all, it is 'pure and plain capitalism' (Loc. 3849). Yet, as Westlake (2014) argues, these proposals go against the stream: 'the most entrepreneurial states, such as Finland, Israel or the United States, generally make unrestricted grants, and where they seek a return, this is generally capped at the original

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<sup>4</sup> 'The movement of capital (business) means that the particular region doing the most to fund the innovation might not be positioned to reap the economic benefits later in terms of, for example, local job creation and taxes.' (Loc. 3808).



level of the grant – the state can get its money back with interest, but not an equity share.’

### Is it ‘pure and plain’ capitalism, after all?

The policy recommendations made in Mazzucato’s 2013 book are quite innovative. It is therefore not surprising that they have been harshly criticised by neoliberal economists and policy-makers. If Mazzucato is successful in undermining neoliberal myths of innovation as the exclusive result of private sector initiative, however, *The Entrepreneurial State* often simply reverses such myths, ending up offering a simplistic analysis of the state-market relationship. A major shortcoming of *The Entrepreneurial State* is its lack of analysis of the social conditions of innovation. Westlake (2014) criticises Mazzucato for focusing exclusively on the invention of new technologies rather than their development or the other investments needed to make them useful. As a consequence, in his view, ‘*The Entrepreneurial State* risks understating the role that business plays, and makes it easier to imply that businesses take no innovative risk at all – to use the book’s metaphor, to describe them as ‘pussycats, not lions’. For William Janeway (2012), moreover, financial speculation plays a major role in innovation, fuelling bubbles that can direct investment towards new technologies, even if the state has a role (apart from that of funding specific innovations) in cleaning up the mess after the crash and the associated destruction of capital. Although delving into these controversies is beyond the scope of my review, Mazzucato’s argument would have been more convincing had she compared successful companies like Apple to other US companies, thus identifying the specific factors that contributed to the differences in firm performance.

Mazzucato, moreover, does not address the structural inequality shaping the employment relation, and sees workers as investing their own capital – that is labour, time and effort – in the innovation process<sup>5</sup>. At points she even argues that workers benefit from precarious forms of employment: while in the Old Economy Business Model employment stability was highly valued and inter-firm mobility was low, in the New Economy Business Model, she argues, employees

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<sup>5</sup> ‘Governments may invest capital and workers may invest labour (time and effort) into the innovation process without any guarantee of a return commensurable with their investments – and without any guarantee that they will be ‘bailed out’ (or not laid off) in case of failure’ (Loc. 3737).

‘highly value the benefits of inter-firm mobility’, and, thus, of employment instability (Loc. 3457).

Even within this framework, however, it is quite remarkable that workers are mentioned only a few times throughout her book: the tripartite model comprising workers, capital and the state usually gives way to a state vs. market model. Mazzucato’s lack of analysis of capitalist production relations, in fact, grounds a view of the state as an external, super-societal entity representing the ‘public’ and ‘collective interest’, thus including the interests of the workers as well. The consequence of this is that workers, and labour, completely disappear from her analysis.

Embedding the innovation process in capitalist production and labour relations would raise questions of ‘who controls’ the innovation process and for ‘what purposes’ These questions, much more radical than simply ‘who gets the return?’, have been addressed not only by thinkers such as Ricardo and Marx, whom Mazzucato only mentions cursorily, but in the history of economic thought at least since the time of the Luddites (for a review, see Vivarelli, 2014). Mazzucato brushes away entire chapters of the history of political economy, and offers a very limited review of current literature on the relationship between innovation, inequality, and production transformations. She overlooks the studies on labour-saving technologies, the employment impact of innovation, and the effects of Information and Communication Technologies (ICTs) on the structures of wages and employment (see, for example, Greenan et al., 2002; Vivarelli, 2014). She also ignores more recent literature seeking to integrate the analysis of the influence of technological change and North–South trade upon wage inequalities in western countries (for example, Chusseau et al., 2008). These questions are are also a key focus for international financial institutions like the World Bank. For example, Cornell University Professor Kaushik Basu (2016), Senior Vice President and Chief Economist of the World Bank, argues that

although labour-saving innovation has been with us for a long time, the pace has picked up. Global sales of industrial robots, for example, reached 225,000 in

2014, up 27 per cent year on year. More transformative, however, is the rise of 'labour-linking' technology: digital innovations over the last three decades now enable people to work for employers and firms in different countries, without having to migrate. [...] As the march of technology continues, these strains will eventually spread to the entire world, exacerbating global inequality – already intolerably high – as workers' earnings diminish. As this happens, the challenge will be to ensure that all income growth does not end up with those who own the machines and the shares.

Mazzucato fails to discuss the impact of new technologies on productivity, the labour process and economic growth. In her book she mainly discusses the invention of General Purpose Technologies (that is technologies that are pervasive, improve over time, and make it easier to invent or produce new products or processes), and focuses on biopharma, the Internet, the iPhone etc. – technologies that are *apparently* good for everybody. In only one passage does she argue that 'cutting-edge revolutionary products like the iPad and iPhone [...] have changed the way that people work and communicate' (Loc. 1933), but does not concretely explain how. She fails to develop a proper analysis of the dynamics of growth and inequality in the US from the 1970s, that is, during the most recent period of innovation discussed in her book. Why is it that, in contrast to previous scientific revolutions, the IT revolution has been associated with slower growth rates (Gordon, 2015), leading to what Solow called the 'productivity paradox'?<sup>6</sup> And why is it that in the midst of one of the greatest revolutions in Information and Communication Technologies, US society has witnessed massive increases, not just in inequality. but also in poverty? By overlooking questions of growth and productivity, and implicitly presupposing that technological innovation increases the well-being of the 'nation'<sup>7</sup>, Mazzucato reduces the issue of inequality to a problem of distribution of rewards *within* western societies.

This western perspective is problematic. Mazzucato admits that Apple's manufacturing and R&D activities are concentrated in low-wage countries, but is not concerned about the conditions of tens of millions of workers at Foxconn International or in the growing R&D labs in China and elsewhere. Thus not only workers in the West ,but also the globalised workforce of companies such as Apple are completely absent from her analysis. What Mazzucato is interested in is the

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<sup>6</sup> Robert Solow is widely quoted as writing in 1987: 'You can see the computer age everywhere but in the productivity statistics.'

<sup>7</sup> For Mazzucato, the main problem is whether 'the New Economy Business Model [will] transform itself so as to distribute the benefits of the ICT revolution [...]' (Loc. 3611).

distribution of the profits between Apple and the US state. She thus astonishingly brushes away the question of where value is produced, presupposing that value is produced where it is captured. In the case of Apple, this would take place *inside* the United States, where at points Mazzucato also seems to locate Apple's 'able workforce'. The contradiction between Mazzucato's western perspective and the reality of an increasingly globalised workforce is also reflected in her lack of analysis of the role of ICTs in the process of global production restructuring. Her only assessment of the role of ICTs is a sentence that simultaneously admits and downplays their importance: 'the globalisation of the workforce is [...] a consequence not only of the development of information and communication technologies, but also of the NEBM' (Loc. 3460–1). Mazzucato, however, offers no explanation of the shift from the so-called Old to the New Business Model either. In discussing how large R&D centres have mostly disappeared in big corporations, she argues that 'why and how this has changed over time' is 'unclear' (Loc. 3636).

Mazzucato's lack of proper social contextualisation of innovation – and of the interests and goals behind it in a capitalist society – is also reflected in her unilateral discussion of the 'green industrial revolution', which overlooks the deleterious effects of biofuels, atomic energy or other technologies on the environment. Attributing the limits of the 'green industrial revolution' in the US to the US reliance on venture capital also fails to problematize the state's active support for atomic and fossil energy. Further, although Mazzucato argues that military and civil sectors are closely entangled in innovation systems – she acknowledges, for example, the crucial contribution of the US Defense Advanced Research Projects Agency (DARPA) to technological innovation in the US – her book just focuses on the 'positive' aspects of innovation and of state initiatives, without even mentioning developments in military and surveillance technologies. She argues in the Conclusion:

It is of course important not to romanticize the State's difference and its ability. The State fearing 'nukes' from the USSR, the sinking of Florida or running out of oil may cause it to do what no one else can – e.g. use its ability to *create money* and risk wasting it on an inane idea/solution, such as war. (Loc. 3913)

Mazzucato seem to ignore that in 2013 the United States had special forces in 134 countries (its Special Operation Command) and was at war in at least five countries: Iraq, Afghanistan, Pakistan, Somalia and Yemen. Surely nuclear weapons, depleted uranium and drones also need to be taken

into account if we are properly to assess the character of the entrepreneurial state.

Embedding the 'entrepreneurial state' within capitalist society, and its contradictions, would certainly complicate the analysis and policy proposals offered in Mazzucato's book. However, this would force us to look for different answers to the timely questions she poses, and it would also allow us to elaborate more realistic alternatives to the economic, social and ecological crisis the planet is facing.

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